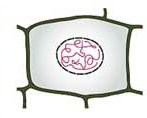
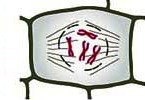
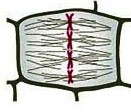
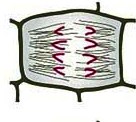
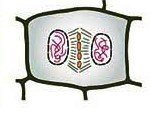
Mitosis

 During interphase the nucleus is visible. The chromosomes are in the nucleus. The nuclear envelope is intact.

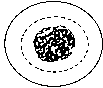
 *During prophase the nuclear envelope breaks down. The chromosomes appear. The spindle appears.*

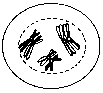
 During metaphase the chromosomes line up on the cell equator. Spindle fibres attach to the centromere of each chromosome.

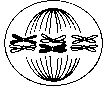
*During anaphase the chromatids are pulled to opposite poles of the cell.*

During telophase the cell contents divide. The nuclear envelopes reform.

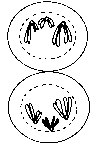
Stage I of meiosis

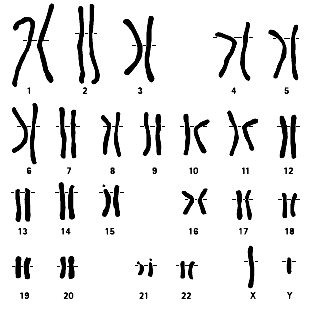
 During interphase the nucleus is visible. The chromosomes are in the nucleus. The nuclear envelope is intact.

*During prophase I the nuclear envelope breaks down. The chromosomes become visible. The homologous chromosomes pair up to form a tetrad. Crossing over takes place.*

During metaphase I the tetrads line up on the cell equator. Chromosomes are joined at chiasmata.

*During anaphase I the recombined chromosomes are pulled to opposite poles of the cell.*

During telophase I two intermediate cells are formed. Stage II of meiosis is similar to mitosis. At the end of meiosis II there are four haploid cells.

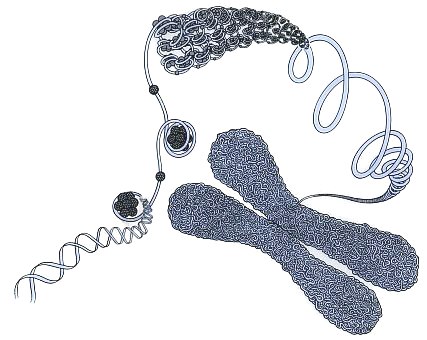


Human karyotype

The chromosomes are arranged according to size.

There are 23 pairs of chromosomes.

*Chromosomes are arranged in homologous pairs.*



Chromosome structure

The chromosome is composed of a single thread of DNA.

*The DNA is bound to histones.*

Histones are proteins.

DNA stands for ‘deoxyribose nucleic acid’.

*The DNA molecule is a double helix.*

Codes and mutations

Any change to the sequence of bases on DNA is called a mutation.

Mutagens are factors which cause mutation.

Examples of mutagens include chemicals and radiation.

A sequence of three bases on DNA is called a triplet.

A sequence of three bases on mRNA is called a codon.

A sequence of three bases on tRNA is called an anticodon.

*Amino acids are joined with peptide bonds.*

*A chain of amino acids is called a polypeptide.*

**11.5 biology revision. 24 March Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

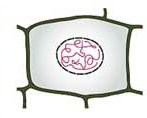
*Instructions: complete the statements and answer all questions*

Mitosis

Phase:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The nucleus is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

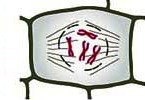
The chromosomes are\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

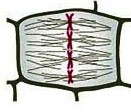


Phase:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The nucleus is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The chromosomes are\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

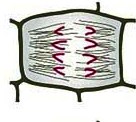




Phase: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The spindle fibres\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The chromosomes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

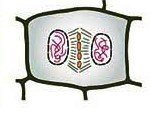


Phase: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The chromatids:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

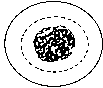
Phase: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Description of process:



Stage I of meiosis

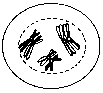
**Keywords:** interphase, prophase I, metaphase I, anaphase I, telophase I, chiasma, crossing over, tetrad, homologous, recombined

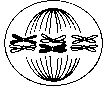


Describe what happens during each stage of meiosis. Use the keywords provided.

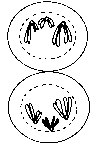
You must write in complete sentences.

1. State two differences between the cells formed by mitosis and those formed by meiosis:
2. That is the purpose of mitosis?
3. What is the purpose of meiosis?

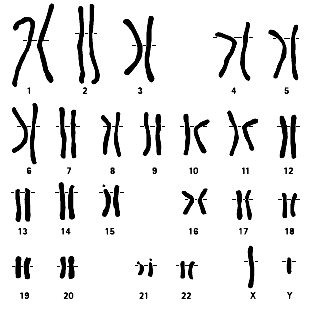




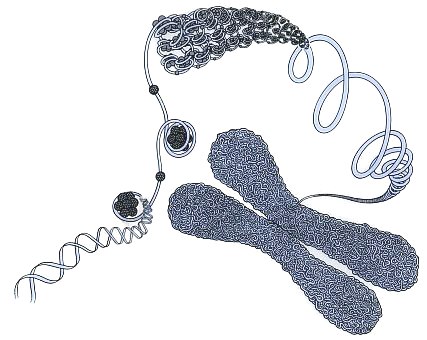




Human karyotype



1. How many pairs of chromosomes are there?
2. How many chromosomes does a human cheek cell contain?
3. How many chromosomes does a human ovum contain?
4. How are the chromosomes arranged?
5. What is the sex of this person?
6. Reason for your answer:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



1. What is a chromosome composed of?
2. What are histones?
3. Describe the shape of the DNA molecule:
4. DNA is made up of nucleotides. What is a nucleotide made up of?
5. *A mutation is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
6. *A mutagen is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
7. *One example of a mutagen is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
8. *The bonds which join amino acids together are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonds*.

Use the table below to complete the sequences on DNA, mRNA and polypeptide.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **codon** | **Amino acid** |  | **codon** | **Amino acid** |
| GGG | glycine | UAU | tyrosine |
| AGG | arginine | GCG | alanine |
| AGU | serine | CCC | proline |
| AAG | lysine | GUU | valine |
| CAG | glutamine |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DNA |  |  | CGC |  | TCC | TCA |  |  |  |
| mRNA | GGG | CAG |  |  |  |  |  | AAG |  |
| polypeptide |  |  |  | tyrosine |  |  | valine |  | proline |